ORLANDO MELCHOR-ALONSO

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EDUCATION

University of Illinois at Urbana-Champaign May 2018
Bachelor of Science in Physics with Distinction GPA: 3.52/4.00
Minor: Computer Science
College of Lake County 2014 - August 2015

WORK EXPERIENCE

Maslov Group at the Carl R. Woese Institute of Genomic Biology Summer 2018
Assistant Researcher in Cancer Diagnostics Software *Urbana, IL*

- Developed a fully-connected neural network that identifies cancerous tissue samples in patients with 95% accuracy.
- Decreased the training time by a factor of 5 and reduced the occurrence of false positives from 10% to 3% by removing costly convolution layers from the benchmark network.
- Analyzed the network weights to correctly identify the top ten RNA sequences that contribute to cancer classifications. The results matched the expected RNA sequences outlined by the Argonne National Lab.

Theoretical & Computational Biophysics Group at the Beckman Institute Summer 2017
Undergraduate Researcher in Secondary Structure Visualization *Urbana, IL*

- Expanded the capabilities of the Visual Molecular Dynamics program by embedding an alternative molecular modeling algorithm that handles larger, more complex molecules.
- Successfully parallelized the modeling software with CUDA to run simulations on high-performance computers.

PROJECT HIGHLIGHTS (SELECTED 2/7)

EchoBook August 2018 - present
Personal Project in Audiobook with Custom Playback

- Designed, tuned, and analyzed an unsupervised model to summarize phonetic data into equally sized embeddings.
- Invented a novel algorithm for finding phonetic embeddings on a graph faster than the nearest neighbor search algorithm to build a subgraph representing the user's voice.
- Created a voice generator that synthesizes audio samples using a person's phonetic subgraph as the template and the audiobook text as the input.

Smash-Hash February 2019 - present
Team Leader in Image Recommendation Network

- Built an image captioning network that creates captions by attending to a portion of the image resulting in faster training and inference times than previous Attention-based approaches.
- Assisted in the design of a Graph Convolutional Network that returns similar images to the input by coarse-graining the caption embeddings on the graph and creating a tree from the remaining images.
- Coordinated with colleagues across the front-ends and back-ends to visualize the recommendation network.

TECHNICAL SKILLS

Operating Systems:	Linux, Windows, and Macintosh.
Computer Languages:	Proficiency in Python, C++, C, JavaScript, Bash, LaTex, MIPS Assembly. Prior experience in R, and Java.
Programming Tools:	PyTorch, Tensorflow, Keras, OpenMP, CUDA, and SQL.

SKILLS

Foreign Language: Spanish, spoken and written.